AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A vehicle control system comprising:

an actuator control ECU, connected to an intra-vehicle communication network, for controlling an actuator that operates in synchronism with a crankshaft angle of a vehicle engine;

a sensor-ECU, connected to the intra-vehicle communication network to which the actuator control ECU is connected, for receiving a crankshaft signal and a camshaft signal of the vehicle engine; and

a ~~timing determining~~means for determining timing of an event with respect to crankshaft angle,

wherein the sensor ECU includes crankshaft angle calculating means for calculating a crankshaft angle on the basis of the received camshaft signal and crankshaft signal and crankshaft angle outputting means for outputting the crankshaft angle calculated by the crankshaft angle calculating means to the ~~timing~~means for determining ~~means~~ timing via the intra-vehicle communication network,

wherein the ~~timing~~means for determining ~~means~~ timing is provided in one of ECUs that are connected to the intra-vehicle communication network and determines operation timing of the actuator on the basis of the received crankshaft angle, and

wherein the actuator control ECU includes timing control means for controlling the actuator on the basis of the timing determined by the ~~timing~~means for determining ~~means~~ timing.

2. (Currently Amended) The vehicle control system according to claim 1,

wherein the crankshaft angle outputting means further outputs, to the ~~timing~~means for determining ~~means~~timing, via the intra-vehicle communication network, information relating to a crankshaft angle at a time point of outputting to the ~~timing~~means for determining ~~means~~timing.

3. (Currently Amended) The vehicle control system according to claim 1,

wherein the ~~timing~~means for determining ~~means~~timing is provided in a timing determination ECU that is connected to the intra-vehicle communication network and is not the actuator control ECU or the sensor ECU, and outputs the determined operation timing of the actuator to the timing control means via the intra-vehicle communication network.

4. (Currently Amended) The vehicle control system according to claim 3,

wherein the intra-vehicle communication network employs a TDMA communication method, and

wherein the TDMA communication method the operation timing determined by the ~~timing~~means for determining ~~means~~timing is assigned to a time between a time slot that is assigned to transmission from the sensor ECU and a time slot that comes first after the former time slot and is assigned to the timing determination ECU.

5. (Currently Amended) The vehicle control system according to claim 1,

wherein the ~~timing~~means for determining ~~means~~ timing determines operation timing of the actuator on the basis of a crankshaft angle received immediately before and a crankshaft angle received one time before using linearly extrapolated time dependency of the crankshaft angle.

6. (Original) The vehicle control system according to claim 1,

wherein the sensor ECU includes failure diagnosing means for performing a failure diagnosis on a crankshaft sensor and a camshaft sensor.

7. (Currently Amended) A vehicle control system comprising:

an actuator control ECU, connected to an intra-vehicle communication network, for controlling an actuator that operates in synchronism with a crankshaft angle of a vehicle engine;

a sensor ECU, connected to the intra-vehicle communication network, for receiving a crankshaft signal of the vehicle engine;

a camshaft ECU, connected to the intra-vehicle communication network, for receiving a camshaft signal of the vehicle engine; and

a ~~timing~~means for determining ~~means~~timing of an event with respect to crankshaft angle,

wherein the crankshaft ECU outputs information based on the received crankshaft signal to the ~~timing~~means for determining ~~means~~ timing,

wherein the camshaft ECU sends information based on the received camshaft signal to the ~~timing~~means for determining ~~means~~timing,

wherein the ~~timing~~means for determining ~~means~~timing determines operation timing of the actuator on the basis of the received information based on the crankshaft signal and information based on the camshaft signal,

wherein the actuator control ECU includes timing control means for controlling the actuator on the basis of the timing determined by the ~~timing~~means for determining ~~means~~timing, and

wherein the intra-vehicle communication network allows the crankshaft ECU to send the information based on the received crankshaft signal without losing it.

8. (Currently Amended) A vehicle control system comprising:

an actuator control ECU, connected to an intra-vehicle communication network, for controlling an actuator that operates in synchronism with a crankshaft angle of a vehicle engine; and

a sensor ECU, connected to the intra-vehicle communication network, for receiving a crankshaft signal of the vehicle engine, and

a ~~timing~~means for determining ~~means~~timing of an event with respect to crankshaft angle,

wherein the sensor ECU includes crankshaft angle calculating means for calculating a crankshaft angle on the basis of the received crankshaft signal and crankshaft angle outputting

means for outputting the crankshaft angle calculated by the crankshaft angle calculating means to the ~~timing~~means for determining ~~means~~ timing via the intra-vehicle communication network,

wherein the ~~timing~~means for determining ~~means~~timing is provided in one of ECUs that are connected to the intra-vehicle communication network and determines operation timing of the actuator on the basis of the received crankshaft angle, and

wherein actuator control ECU includes timing control means for controlling the actuator on the basis of the timing determined by the ~~timing~~means for determining ~~means~~timing.

9. (Currently Amended) The vehicle control system according to claim 8,

wherein the crankshaft angle outputting means further outputs, to the ~~timing~~means for determining ~~means~~timing via the intra-vehicle communication network, information relating to a crankshaft angle at a time point of the outputting to the ~~timing~~means for determining ~~means~~timing.

10. (Original) The vehicle control system according to claim 8,

wherein the actuator is an electromagnetic valve.

11. (New) A method for controlling an actuator in synchronism with an engine crankshaft angle using a communication network, said method comprising:

monitoring crankshaft rotational angle with a first ECU subsystem that calculates crankshaft angle based on received transducer signal representing rotation of the crankshaft and camshaft;

controlling actuator operation using a second ECU subsystem, said first and second ECU subsystems being connected for inter-communication of data via said communication network; and

determining actuator operation timing based on said calculated crankshaft angle and using said determined timing to control the actuator.

12. (New) A method as in claim 11

wherein data representing said calculated crankshaft is conveyed via said communication network.

13. (New) A method as in claim 11

wherein said determining step is performed in a third ECU subsystem that also communicates via said communication network.

14. (New) A method as in claim 13

wherein TDMA is utilized to communicate data on said communication network and determined actuator operation timing data is assigned to a time slot having a known relative position and wherein the determined actuator operation timing data is calculated to compensate for any expected delay in data communication over said communication network.

15. (New) A method as in claim 11

wherein said determining step uses crankshaft angle data received for at least two prior times and uses linearly extrapolate time dependency of the crankshaft angle.

16. (New) A method as in claim 11

wherein the first ECU subsystem also performs a failure diagnosis on a crankshaft sensor and a camshaft sensor.

17. (New) A method as in claim 11 wherein:

said first ECU subsystem uses a sensor ECU, connected to the communication network, to monitor a crankshaft sensor signal and a camshaft ECU connected to the communications network, to monitor a camshaft sensor signal; and

said determining step uses data received from the sensor ECU and the camshaft ECU via said communication network which allows the crankshaft ECU to send data based on the monitored crankshaft sensor signal without losing it.

18. (New) A method as in claim 11 wherein:

said determining step uses calculated crankshaft angle data communicated over said communications network.

19. (New) A method as in claim 18

wherein said crankshaft angle data that is communicated includes information relating to the expected crankshaft angle at the time of such communication.

20. (New) A method as in claim 18

wherein the controlled actuator is an electromagnetic valve.